

What is claimed is.

1 1. A method of transmitting data over a communica-
2 tions network, comprising the steps of:

3 receiving content from a content provider;

4 responsive to said content establishing a first group
5 directory in a cache;

6 transmitting said first group directory from said
7 cache on a data channel to a subsidiary cache;

8 establishing a second group directory in said sub-
9 sidiary cache, said second group directory being derived
10 from said first group directory; and

11 transmitting said second group directory from said
12 subsidiary cache to a multicast group of receivers.

1 2. The method according to claim 1, wherein said step
2 of transmitting said first group directory is performed
3 using a REMADE protocol.

1 3. The method according to claim 1, wherein said step
2 of transmitting said first group directory is performed
3 by periodic transmission thereof.

1 4. The method according to claim 1, wherein said step
2 of transmitting said first group directory is performed
3 in response to a request from a receiver thereof.

1 5. The method according to claim 1, wherein said step
2 of transmitting said first group directory is performed
3 according to a policy of said content provider.

1 6. The method according to claim 1, wherein said step
2 of transmitting said second group directory is performed
3 by periodic transmission thereof.

1 7. The method according to claim 1, wherein said step
2 of transmitting said second group directory is performed
3 in response to a request from a receiver.

1 8. The method according to claim 1, wherein said step
2 of transmitting said second group directory is performed
3 using a REMADE protocol.

1 9. The method according to claim 1, wherein said step
2 of transmitting said second group directory is performed
3 according to a policy of said content provider.

1 10. The method according to claim 1, wherein said
2 content provider comprises a plurality of content provid-
3 ers.

1 11. The method according to claim 1, wherein said
2 subsidiary cache comprises a plurality of subsidiary
3 caches.

1 12. The method according to claim 11, wherein said
2 cache and said subsidiary caches are linked together as a
3 hierarchical tree, said cache forming a root of said hi-
4 erarchical tree.

1 13. The method according to claim 11, further com-
2 prising the steps of:

3 receiving a transmission request from a member of
4 said group of receivers, wherein said transmission re-
5 quest is responsive to said second group directory; and
6 responsive to said transmission request, transmitting
7 a data item from said subsidiary cache to said receiver.

1 14. The method according to claim 1, wherein said
2 first group directory comprises a root directory hierar-
3 chically linked to a plurality of subdirectories, said
4 subdirectories carrying a list of data items, a subtree
5 of said first group directory being defined by one of
6 said subdirectories and at least one linked subdirectory
7 thereunder.

1 15. The method according to claim 1, wherein said
2 second group directory comprises a root directory hierar-
3 chically linked to a plurality of subdirectories, said
4 subdirectories carrying a list of data items, a subtree
5 of said second group directory being defined by one of
6 said subdirectories and at least one linked subdirectory
7 thereunder.

1 16. A computer software product, comprising a com-
2 puter-readable medium in which computer program instruc-
3 tions are stored, which instructions, when read by at
4 least one computer, causes said at least one computer to
5 execute a method of transmitting data over a communica-
6 tions network, comprising the steps of:

7 in a first server receiving content from a content
8 provider;

9 responsive to said content establishing a first group
10 directory in a cache of said first server;

11 transmitting said first group directory from said
12 cache on a data channel to a second server having a sub-
13 sidiary cache;

14 establishing a second group directory in said sub-
15 sidiary cache, said second group directory being derived
16 from said first group directory; and

17 transmitting said second group directory from said
18 subsidiary cache to a multicast group of receivers.

1 17. The computer software product according to claim
2 16, wherein said step of transmitting said first group
3 directory is performed using a REMADE protocol.

1 18. The computer software product according to claim
2 16, wherein said step of transmitting said first group
3 directory is performed by periodic transmission thereof.

1 19. The computer software product according to claim
2 16, wherein said step of transmitting said first group

3 directory is performed in response to a request from a
4 receiver.

1 20. The computer software product according to claim
2 16, wherein said step of transmitting said first group
3 directory is performed according to a policy of said con-
4 tent provider.

1 21. The computer software product according to claim
2 16, wherein said step of transmitting said second group
3 directory is performed by periodic transmission thereof.

1 22. The computer software product according to claim
2 16, wherein said step of transmitting said second group
3 directory is performed in response to a request from a
4 receiver.

1 23. The computer software product according to claim
2 16, wherein said step of transmitting said second group
3 directory is performed using a REMADE protocol.

1 24. The computer software product according to claim
2 16, wherein said step of transmitting said second group
3 directory is performed according to a policy of said con-
4 tent provider.

1 25. The computer software product according to claim
2 16, wherein said content provider comprises a plurality
3 of content providers.

1 26. The computer software product according to claim
2 16, wherein said subsidiary cache comprises a plurality
3 of subsidiary caches.

1 27. The computer software product according to claim
2 26, wherein the method further comprises the steps of:
3 receiving a transmission request from a member of
4 said group of receivers, wherein said transmission re-
5 quest is responsive to said second group directory; and
6 responsive to said transmission request, transmitting
7 a data item from said subsidiary cache to said receiver.

1 28. The computer software product according to claim
2 26, wherein said cache and said subsidiary caches are
3 linked together as a hierarchical tree, said cache form-
4 ing a root of said hierarchical tree.

1 29. The computer software product according to claim
2 16, wherein said first group directory comprises a root
3 directory hierarchically linked to a plurality of subdi-
4 rectories, said subdirectories carrying a list of data
5 items, a subtree of said first group directory being de-
6 fined by one of said subdirectories and at least one
7 linked subdirectory thereunder.

1 30. The computer software product according to claim
2 16, wherein said second group directory comprises a root
3 directory hierarchically linked to a plurality of subdi-

4 rectories, said subdirectories carrying a list of data
5 items, a subtree of said second group directory being de-
6 fined by one of said subdirectories and at least one
7 linked subdirectory thereunder.

1 31. A system for transmitting data over a communica-
2 tions network, comprising:

3 a first server, having a cache therein, receiving
4 content from a content provider, wherein responsive to
5 said content a first group directory is established in
6 said cache by said first server,

7 a second server, having a subsidiary cache therein,
8 said first group directory being transmitted by said
9 first server from said cache on a data channel to said
10 subsidiary cache, wherein responsive to said first group
11 directory, a second group directory is established in
12 said subsidiary cache by said second server, said second
13 group directory being derived from said first group di-
14 rectory, and said second group directory is transmitted
15 by said second server from said subsidiary cache to a
16 multicast group of receivers.

1 32. The system according to claim 31, wherein said
2 first group directory is transmitted using a REMADE pro-
3 tocol.

1 33. The system according to claim 31, wherein said
2 first group directory is transmitted periodically.

1 34. The system according to claim 31, wherein said
2 first group directory is transmitted in response to a re-
3 quest from a receiver thereof.

1 35. The system according to claim 31, wherein said
2 first group directory is transmitted according to a pol-
3 icy of said content provider.

1 36. The system according to claim 31, wherein said
2 second group directory is transmitted periodically.

1 37. The system according to claim 31, wherein said
2 second group directory is transmitted in response to a
3 request from a receiver.

1 38. The system according to claim 31, wherein said
2 second group directory is transmitted using a REMADE pro-
3 tocol.

1 39. The system according to claim 31, wherein said
2 second group directory is transmitted according to a pol-
3 icy of said content provider.

1 40. The system according to claim 31, wherein said
2 content provider comprises a plurality of content provid-
3 ers.

1 41. The system according to claim 31, wherein said
2 subsidiary cache comprises a plurality of subsidiary
3 caches.

1 42. The system according to claim 41, wherein said
2 cache and said subsidiary caches are linked together as a
3 hierarchical tree, said cache forming a root of said hi-
4 erarchical tree.

1 43. The system according to claim 41, wherein said
2 second server receives a transmission request from a mem-
3 ber of said group of receivers, wherein said transmission
4 request is responsive to said second group directory; and
5 responsive to said transmission request, said second
6 server transmits a data item from said subsidiary cache
7 to said receiver.

1 44. The system according to claim 31, wherein said
2 first group directory comprises a root directory hierar-
3 chically linked to a plurality of subdirectories, said
4 subdirectories carrying a list of data items, a subtree
5 of said first group directory being defined by one of
6 said subdirectories and at least one linked subdirectory
7 thereunder.

1 45. The system according to claim 31, wherein said
2 second group directory comprises a root directory hierar-
3 chically linked to a plurality of subdirectories, said
4 subdirectories carrying a list of data items, a subtree

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5 of said second group directory being defined by one of
6 said subdirectories and at least one linked subdirectory
7 thereunder.